

4.9 Sediment Barrier

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Definition

Sediment barriers are temporary structures typically constructed of silt fence supported by steel or wood posts. Other types of barriers may include sandbags, straw bales, brush piles, and other filtering material.



Purpose

Sediment barriers are used to prevent sediment carried by sheet flow from leaving the site and entering natural drainage ways or storm drainage systems by slowing stormwater runoff and causing the deposition of sediment at the structure.

Conditions

Use sediment barriers under the following conditions:

1. Below small disturbed areas less than $\frac{1}{4}$ acre per 100 feet of fence.
2. Where runoff can be stored behind the sediment fence without damaging the fence or the submerged area behind the fence.

Do not install sediment fences across streams, ditches, or waterways.

Design Criteria

Ensure that the drainage area is no greater than $\frac{1}{4}$ acre per 100 feet of non-reinforced fence. For wire-reinforced fence, the drainage area should not exceed $\frac{1}{2}$ acre.

Make the fence stable for the runoff from 10-year, 24-hour storm or the storm specified by local code. Where all runoff is to be stored behind the fence, ensure that the maximum slope length behind the sediment fence does not exceed the specifications shown in Table 4.9.1.

If non-erosive outlets are provided, slope length may be increased beyond that shown in Table 4.9.1, but runoff from the area should be determined, and bypass capacity and erosion potential along the fence must be checked. The velocity of the flow at the outlet

or along the fence should be consistent with velocities and flow limitations shown on Table 4.9.1.

TABLE 4.9.1
Criteria for Sediment Barrier Placement

Land Slope (percent)	Maximum Slope Length Behind Fence (feet)
<2	100
2 to 5	75
5 to 10	50
10 to 20	25
> 20	15

Provide a riprap splash pad or other outlet protection device for any point such as natural depressions or swales where flow may top the sediment fence. Ensure that the maximum height of the fence at a protected, reinforced outlet does not exceed 1 foot and that support post spacing does not exceed 4 feet.

The design life of a synthetic sediment fence should be 6 months. Burlap is only acceptable for periods up to 60 days.

Construction Specifications

Sandbags

Sandbags should be installed so that flow under or between bags is minimal. Anchoring with steel rods may be required if structure height exceeds two bags. Use of sandbags must be approved by the local issuing authority.

Hay or Straw Bales

Bales will be placed lengthwise in a single row, on the contour, and embedded in the soil to a depth of 4 inches. Bales must be securely anchored in place by stakes or bars driven through the bales or by other acceptable means to prevent displacement.

Figure 4.9.1 indicates installation requirements for straw bale barriers.

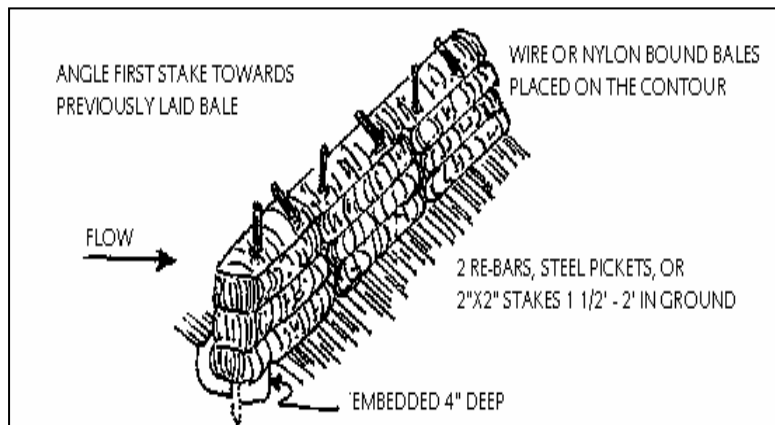


Figure 4.9.1 Straw Bale Barrier Installation Requirements

Brush

Brush obtained from clearing operations may be piled in a row along the perimeter of land-disturbing activities. Brush should be windrowed on the contour as nearly as possible.

Brush may require compaction. Construction equipment may be used to accomplish this purpose.

If greater filtering capacity is required, a commercially available filtering fabric may be placed on the construction side of the brush barrier. The lower edge of the fabric must be buried in a trench 4 to 6 inches deep. The upper edge must be stapled, tied, or otherwise fastened to the brush barrier.

Brush barriers should be removed after the area is stabilized if the barrier is not aesthetically acceptable.

Silt Fence

A silt fence is specifically designed to allow water to pass through while retaining sediment on-site. A silt fence may be used in conjunction with a straw bale barrier to improve effectiveness and provide additional stability.

Silt Fence Specifications

Two widths of silt fence are available, Type A or C (36 inches high) and Type B (22 inches high). In order to determine the most suitable type fence, project duration, slope

gradient, and slope length must be considered (see Table 4.9.2). A silt fence must meet the minimum standards set forth.

TABLE 4.9.2
Silt Fence Types

Width of Fabric	Use
Type A (36 inches)	On developments where the life of the project is greater than or equal to 6 months. Where the slope gradient is steeper than 3:1.
Type B (22 inches)	On projects such as residential home sites or small commercial developments, where the life of the project is less than 6 months. Where the slope gradient is less than or equal to 3:1.
Type C (36 inches)	Where fill slopes exceed a vertical height of 20 feet and the slope gradient is steeper than 3:1.

Silt Fence Installation

The contractor must install the temporary silt fence according to this specification, as shown on the plans, or as directed by the engineer. For installation of Type A, B, or C, see Figures 4.9.2, 4.9.3, and 4.9.4, respectively.

Post installation must start at the center of the low point (if applicable) with remaining posts spaced at 6-foot intervals. For post size requirements of Type A or C and B fabric, see Table 4.9.3. Fasteners for wood posts are listed in Table 4.9.4.

TABLE 4.9.3
Post Sizes

Fabric	Minimum Length	Type of Post	Size of Post
Type A	4 feet	Soft wood	3-Inch-Diameter of 2 by 4 Inches
		Oak	1.5-Inch by 1.5-Inch-Diameter
		Steel	1.3-Pound per Foot Minimum
Type B	3 feet	Soft wood	2-Inch-Diameter or 2 by 2 Inches
		Oak	1-Inch by 1-Inch
		Steel	.75-Pound per Foot Minimum
Type C	4 feet	Steel	1.3-Pound per Foot Minimum

TABLE 4.9.4
Fasteners for Wood Posts

Fastener	Gauge	Crown/Length	Legs/ Button Heads	Staples/Nails per Post
Wire Staples	17 min.	¾ inch wide	½ inch long	5 min.
Nails	14 min.	1 inch	¾ inch	4 min.

Silt Fence Maintenance and Removal

The contractor must maintain the silt fence until the project is vegetated or accepted. Filter fabric must be replaced when it has deteriorated to such an extent that the effectiveness of the fabric is reduced.

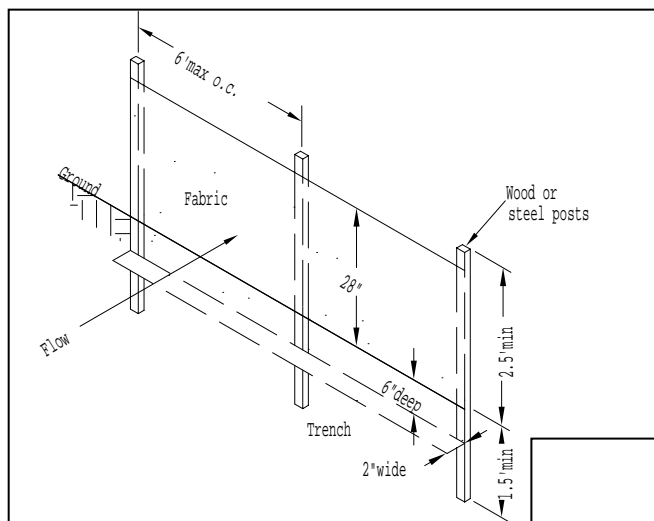


Figure 4.9.2 Use Type "A" Silt Fence

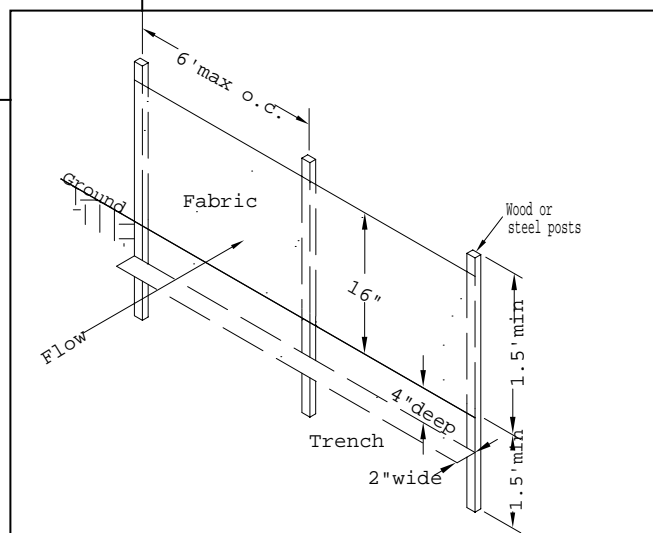


Figure 4.9.3 Use Type "B" Silt Fence

Stormwater Best Management Practices

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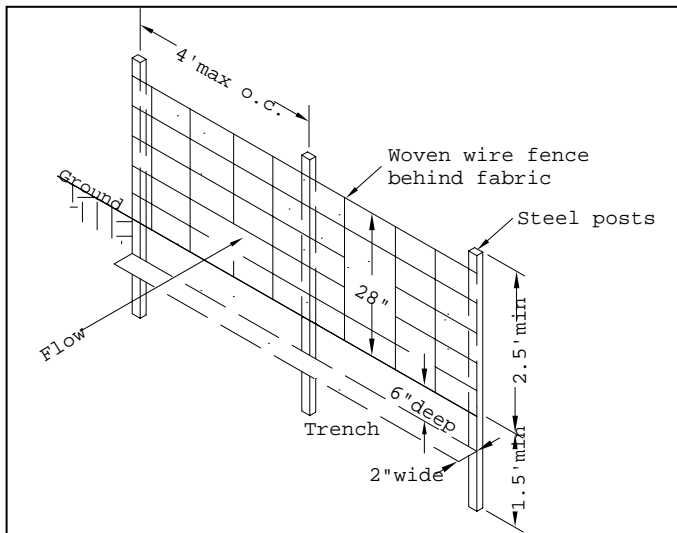


Figure 4.9.4 Type "C" Silt Fence



Figure 4.9.5 Typical Type "C" Silt fence

TABLE 4.9.5
Silt Fencing Specifications

Type Fence	A	B	C
Tensile Strength (lbs. Min) ¹ (ASTM D-4632)	Warp – 120 Fill – 100	Warp – 120 Fill – 100	Warp – 260 Fill – 180
Elongation (% Max) (ASTM D-4632)	40	40	40
Apparent Opening Size (Max. Sieve Size) (ASTM D-4751)	#30	#30	#30
Flow Rate (Gal/Min/Sq. Ft) (GDT-87)	25	25	70
Ultraviolet Stability ² (ASTM D-4632 after 300 hours weathering in accordance with ASTM D-4355)	80	80	80
Bursting Strength (PSI Min.) (ASTM D-3786 Diaphragm Bursting Strength Tester)	175	175	175
Minimum Fabric Width (inches)	36	22	36

¹ Minimum roll average of five specimens.

² Percent of required initial minimum tensile strength.